

CLAIMS:

5 ⁵⁰ 1. A method comprising:
generating gray elements and a dithered gray background for display on a
display device, the dithered gray background representing a gray level of approximately
25 to 40%; and

estimating a gamma for the display device based on user selection of one of the
gray elements that appears to most closely blend with the dithered gray background.

10 2. The method of claim 1, wherein the dithered gray background represents
a gray level of approximately 33%.

15 3. The method of claim 1, wherein the gray elements include green
elements representing a range of gray levels for the green channel, and the dithered gray
background is a dithered green background.

4. The method of claim 1, further comprising characterizing the
colorimetric response of the display device based on the estimated gamma.

20 5. The method of claim 1, the method further comprising:
modifying a color image based on the estimated gamma; and
delivering the modified color image to the display device.

25 6. The method of claim 1, wherein the display device is associated with a
client residing on a computer network, the method further comprising:

transmitting information representing the estimated gamma to a remote server
on the network;

30 modifying the color image at the remote server based on the information; and
delivering the modified color image to the client via the computer network for
display on the display device.

7. The method of claim 1, wherein estimating the gamma includes:
selecting one of a first plurality of gray elements displayed by the display device
that appears to most closely blend with the dithered gray background;
estimating a coarse gamma for the display device based on the selected one of
the first plurality of gray elements;
selecting one of a second plurality of gray elements displayed by the display
device that appears to most closely blend with the dithered gray background, wherein
the second plurality of gray elements includes the selected one of the first plurality of
gray elements; and
estimating a fine gamma for the display device based on the selected one of the
second plurality of gray elements, wherein the estimated fine gamma is the estimated
gamma.

8. The method of claim 7, wherein the first plurality of gray elements
represent greater gradations in gray intensity than the second plurality of gray elements.

9. The method of claim 1, wherein the gray elements are green elements
representing a range of gray levels for the green channel, and the dithered gray
background is a dithered green background, the method further comprising:
selecting one of the selected green element and a plurality of red-blue shifted
elements displayed by the display device that appears to most closely blend with the
second dithered green background displayed by the display device; and
estimating the gray balance of the display device based on the selected one of
the selected green element or selected red-blue shifted element.

10. The method of claim 9, wherein the red-blue shifted elements represent
shifts in red, blue, or a combination of red and blue away from the color value of the
selected green element.

11. The method of claim 9, wherein the red-blue shifted elements do not represent any substantial shift in green away from the color value of the selected green element.

5 12. The method of claim 1, further comprising:
estimating both the blackpoint and the gray balance of the display device; and
characterizing the colorimetric response of the display device based on the
estimated gamma, blackpoint, and gray balance.

10 13. The method of claim 12, wherein the display device is associated with a
client residing on a computer network, the method further comprising:
transmitting information representing the estimated blackpoint, gamma, and
gray balance to a remote server on the network;
15 modifying the color image at the remote server based on the information; and
delivering the modified color image to the client via the computer network for
display on the display device.

20 14. The method of claim 1, wherein the display device is associated with a
client on a computer network, the method further comprising guiding the client through
the process of obtaining the estimated gamma by delivering one or more instructional
web pages to the client.

25 15. A system comprising:
a web server residing on a computer network, the web server transmitting web
pages to remote clients residing on the computer network;
a color image server residing on the computer network, the color image server
transmitting color images referenced by the web pages to the clients for display on
display devices associated with the clients;
30 a color profile server residing on the computer network, the color profile server
guiding the clients through a color profiling process to obtain information
characterizing the color responses of the display devices associated with the clients,

wherein the information includes a gamma for the display device, the gamma being determined by selecting one of a plurality of gray elements displayed by the display device that appears to most closely blend with a dithered gray background that represents a gray level of approximately 25 to 40%; and

5 one or more color correction modules that modify the color images transmitted by the color image server based on the information to improve the accuracy of the color images when displayed on the respective display device.

10 16. The system of claim 15, wherein the color image server stores the information to the client in a web cookie, the client transmits the web cookie from the client to the server, and the color image server modifies the color image via the server based on the contents of the web cookie.

15 17. The system of claim 5, wherein the dithered gray background represents a gray level of approximately 33%.

20 18. The system of claim 15, wherein the gray elements include green elements representing a range of gray levels for the green channel, and the dithered gray background is a dithered green background.

25 19. The system of claim 18, wherein the color profiling process includes:
selecting one of the selected green element and the plurality of red-blue shifted elements displayed by the display device that appears to most closely blend with the dithered green background displayed by the display device; and
estimating the gray balance of the display device based on the selected one of the selected green element or selected red-blue shifted element.

30 20. The system of claim 19, wherein the red-blue shifted elements represent shifts in red, blue, or a combination of red and blue away from the color value of the selected green element.

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select one the gray elements that appears to most closely blend with a dithered gray background; and

estimate a gamma for the display device based on the selected gray element.

5 26. The computer-readable medium of claim 25, wherein the dithered gray background represents a gray level of approximately 33%.

10 27. The computer-readable medium of claim 25, wherein the gray elements include green elements representing a range of gray levels for the green channel, and the dithered gray background is a dithered green background.

15 28. The computer-readable medium of claim 25, wherein the instructions cause the processor to characterize the colorimetric response of the display device based on the estimated gamma.

20 29. The computer-readable medium of claim 25, wherein the instructions cause the processor to:
 modify a color image based on the estimated gamma; and
 deliver the modified color image to the display device.

25 30. The computer-readable medium of claim 25, wherein the display device is associated with a client residing on a computer network, and wherein the instructions cause the processor to:
 transmit information representing the estimated gamma to a remote server on the network;
 modify the color image at the remote server based on the information; and
 deliver the modified color image to the client via the computer network for display on the display device.

30 31. The computer-readable medium of claim 25, wherein the instructions cause the processor to estimate the gamma by:

selecting one of a second plurality of gray elements displayed by the display device that appears to most closely blend with the dithered gray background, wherein the second plurality of gray elements includes the selected one of the first plurality of gray elements; and

estimating a fine gamma for the display device based on the selected one of the second plurality of gray elements, wherein the estimated fine gamma is the estimated gamma.

32. The computer-readable medium of claim 31, wherein the first plurality of gray elements represent greater gradations in gray intensity than the second plurality of gray elements.

33. The computer-readable medium of claim 25, wherein the gray elements are green elements representing a range of gray levels for the green channel, and the dithered gray background is a dithered green background, the instructions causing the processor to:

select one of the selected green element and a plurality of red-blue shifted elements displayed by the display device that appears to most closely blend with the second dithered green background displayed by the display device; and

estimate the gray balance of the display device based on the selected one of the selected green element or selected red-blue shifted element.

34. The computer-readable medium of claim 33, wherein the red-blue shifted elements represent shifts in red, blue, or a combination of red and blue away from the color value of the selected green element.

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$\frac{P_1 P_2}{C_1 C_2}$